

Landscape architecture and the challenge of climate change

Landscape
Institute
Position statement



Foreword

As we confront growing social, political and economic concern over the use of our natural resources and the development of sustainable communities, there has never been a more important time to highlight the role of landscape architecture. Landscape architects take an holistic approach of the sort needed to create environmentally sustainable places where people want to live and work.

The Rt Hon Hilary Benn, Secretary of State for the Environment, Food and Rural Affairs, said during a recent address to landscape architects "...you bring together the skills, knowledge and passion that we need for the 21st century in the way that engineering shaped the 19th century. We need you in the fight against climate change. You can show people how it can be done. Your Institute has established a record to be proud of – whether greening gardens or greening the 2012 Olympics, from being leaders in the design of cleaner, greener neighbourhoods to pioneers of green energy and green infrastructure projects."

Responding to this challenge, this Position Statement is designed to:

- Demonstrate to stakeholders and government the critical and central role that the landscape architecture profession has to play in the delivery of climate change policy objectives.
- Inspire clients to adopt an holistic, landscape architecture approach to development which reinforces commercial and public objectives whilst delivering resilience in the face of a changing climate and assisting in the reduction of greenhouse gas emissions.
- Provide guiding principles and case studies of the approaches taken by landscape architects to climate change adaptation and mitigation.

The Landscape Institute calls for the work of landscape architects to be recognised as critical in the fight against climate change. To this end, far greater appreciation is needed of the holistic approach that landscape architecture represents and its fundamental importance in securing our sustainable future. Our vision is of a world that has adapted to climate change and where further changes are mitigated. This vision will be possible if landscape architects provide leadership and are given opportunities to exert this both now and in the future.

Neil Williamson
President

Jon Lovell
Chair, Policy Committee

**Landscape
Institute**
Position statement



- 1.1** It is widely accepted that our climate is changing and that these changes are at least in part a result of human activity. In its 2007 publication 'Climate Change 2007: Synthesis Report – Summary for Policymakers' the Intergovernmental Panel on Climate Change (IPCC) broadly concludes that:
- CO2 levels are at their highest for 650,000 years
 - climate change is unequivocally happening
 - there is a 90% chance that this is the result of human activity
 - we have 10-15 years left to put in place serious measures to start reducing emissions
- 1.2** Leading bodies researching climate change are monitoring and analysing climate patterns worldwide. The evidence that the climate is already changing is now irrefutable. These changes are set to continue, irrespective of future greenhouse gas emissions, because of the cumulative impacts of the emissions that have arisen since the onset of industrialisation. Adapting landscapes and places to these changes is an urgent challenge for all those that have a role to play in the management of the built and natural environment.
- 1.3** The impacts of these changes in the UK have been comprehensively researched by the UK Climate Impacts Programme (UKCIP) and, via UKCIP02, a number of forecast scenarios have been established for the coming century based upon different future emission trends. These include:
- hotter, drier summers
 - warmer, wetter winters
 - an increase in the frequency of some extreme weather events
 - rising sea levels
- 1.4** These scenarios could have significant impacts upon our landscapes, including:
- Intensification of the urban heat island effect as a result of higher temperatures, particularly in summer, leading to risks to human health in the built environment.
 - Water shortages as a result of reduced rainfall and increased evapotranspiration, affecting the vitality and productivity of vegetation.
 - Flooding, particularly in our built environments and floodplains, as a result of increased rainfall intensity and increasingly frequent storm events.
 - Rising sea levels leading to significant landscape impacts in coastal areas, including displacement of communities, social infrastructure, biodiversity and alterations to landform configurations.
 - Changes in biodiversity as a consequence of new climatic conditions, particularly temperature and humidity levels. As some species increase in number and range whilst others decline, food provision, the spread of diseases and our enjoyment of a healthy and aesthetically pleasing environment all stand to be affected.
 - Decreasing air quality as a result of higher temperatures and possible increases in ultraviolet radiation, which could have consequences for human health and comfort.
 - The character of our landscapes, as a changing climate impacts upon environmental, cultural, social and economic factors which shape this character.
- 1.5** The consequences of climate change are likely to be far more severe, at least in the short term, in other parts of the world, particularly in equatorial regions where the impacts of drought and flooding are likely to have major consequences for people, wildlife and landscapes. Climate change has the potential to render some locations uninhabitable, with conflict over access to water, energy and food already evident in some places, and this may well lead to climate-related migration to more hospitable regions such as the UK.

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- 1.6 These competing demands require new and regenerated landscapes, in the UK and across the world, to be planned, designed and managed in a far more sustainable way than is currently practised. This needs to be based on a thorough understanding of ecosystem services and the interconnectivity of natural processes and human life.
 - 1.7 Climate change will have profound effects upon every aspect of our society, our economy and the ecosystems which support them. All of these present risks for landscape in its broadest sense and are of direct concern to the work of the landscape architect. Through their training and expertise, landscape architects are well positioned to provide holistic approaches to the planning and management of the built environment and rural areas. They have the ability to help address the environmental, social and economic challenges which face us all.
 - 1.8 Recognition of this fact presents an opportunity for landscape architects to shape a renaissance in the quality of both natural and built environments, ensuring a sustainable future not only for people and places but also for flora and fauna.

2. Responding to climate change

- 2.1 Landscapes that are multifunctional have the ability to provide food, energy, water storage and flood mitigation as well as providing a valuable resource for biodiversity and promoting health and well being. The holistic approach traditionally taken by the landscape architect to masterplanning, landscape design and management means that the profession has a responsibility for environmental stewardship. The profession also has a wider role to plan, create and design sustainable communities, bringing a balanced environmental, social and economic approach to tackling climate change.
- 2.2 Sustainable landscape planning, design and management are essential if we are to adapt our environments to a changing climate and to mitigate future change. In many instances, landscape responses incorporate a range of mitigation and adaptation principles, with many of these being interlinked and mutually-reinforcing, whilst also providing wider socio-economic and environmental benefits. For example, provision of urban green space will mitigate through carbon storage as well as reducing surface run-off, an important aspect of adaptation.
- 2.3 Landscape architects provide an holistic approach to the protection, conservation and enhancement of urban and rural landscapes which takes account of environmental, social and economic conditions. This approach will assist in mitigating and adapting to future climate change and ensure the future sustainability of our landscapes and the communities within them.

3. Mitigation

- 3.1 There is a growing consensus that human activities are at least making a contribution to climate change via greenhouse gas emissions. This means that all of us can take steps to lessen the magnitude of future change. The Landscape Institute recognises fully the need to reduce human-induced causes of climate change. There are many ways, at a range of different scales, in which landscape architects can play a central role in helping to achieve this.
- 3.2 Large scale intervention
 - In functioning as masterplanners, landscape architects can shape all facets of existing and new communities to encourage more sustainable lifestyles.
 - Fully integrating building and site planning into the landscape planning process, taking account of landscape characteristics such as topography, vegetation and microclimate and helping to maximise the benefits of shelter from intense wind and sun while seeking to incorporate maximum solar energy and water heating benefits.
 - Providing attractive opportunities for local outdoor leisure opportunities, also contributing to improving public health, well being and community engagement.
 - Integrating and maximising local food production in the landscape, thereby reducing 'food miles' as a result of transportation and promoting more localised self-sufficiency.

3.3 Site specific intervention

- The creation of urban carbon sinks via the provision of green space which removes carbon from the atmosphere via storage in biomass and the release of oxygen.
- The installation of green roofs and green walls, thereby improving the thermal efficiency of buildings and reducing the use of conventional heating and cooling systems, whilst also alleviating flood risk.
- The technical and creative use of open space for ground source heating and cooling.

3.4 Working practices

- Local and sustainable sourcing of construction materials, with timber from sustainable sources and greater use of recycled content.
- Reducing the carbon contributions made by day-to-day working practices, for example, travelling and office operations.
- Procurement of contractual services from organisations which demonstrate that effective measures are in place to minimise the carbon intensity of capital works and site management activities.

3.5 Renewable energy

Not only will climate change alter landscape and landscape character, but our technical responses to mitigate climate change will have additional implications. We will therefore increasingly be faced with the difficult task of making decisions relating to the scale, nature and location of renewable energy solutions and balancing such requirements with the values we attribute to landscapes.

The expertise that landscape architects have in design and the use of landscape and visual impact assessments ensures that proposals for the development of renewable energy generation, including bioenergy, can respond to and be properly considered in their wider environmental context. The Landscape Institute is fully committed to the maximisation of renewable energy capacity as an essential aspect of climate change mitigation whilst ensuring the robust protection and enhancement of landscape character and condition. The profession is also well placed to ensure that renewable and low-carbon energy installations do not lead to perverse carbon impacts, such as carbon release through the drying of peat bogs resulting from inappropriate wind turbine development.

4. Adaptation

4.1 Even if attempts to mitigate climate change via the reduction of greenhouse gas emissions are successful, the consequences of what has happened to date will remain with us for decades to come.

4.2 The holistic approach to place-making of the landscape architect is critical to the creation of environments that are robust and flexible to climate change. These skills need to be employed at the earliest possible opportunity in the design and delivery of projects.

4.3 Green Infrastructure

Green infrastructure can be defined as the network of spaces and natural elements that are present in and interconnect our landscapes. The concept can be applied at varying scales from the local/neighbourhood to the town/city and the city-region/region. It represents an holistic approach to the natural and built environment which recognises the important, multifunctional role it has to play in providing benefits for the economy, biodiversity, wider communities and individuals as well as playing an important part in climate change adaptation. Components of green infrastructure can include:

- At local/neighbourhood scale
- street trees and hedgerows
 - pocket parks
 - cemeteries
 - small woodlands

At town/city scale

- city parks
- green networks
- forest parks
- lakes
- rights of way

At city-region/regional scale

- regional parks
- rivers and floodplains
- long distance trails
- reservoirs

Effective adaptation to climate change can be facilitated by green infrastructure approaches to planning and design. Green spaces and corridors help to cool our urban environments, improve air quality and ameliorate surface run-off. A green infrastructure planning approach will reduce flood risk, protect building integrity and improve human health and comfort in the face of more intense rainfall and higher temperatures. Well-connected green infrastructure also provides wildlife corridors for species migration in the face of climate change as well as wider benefits for recreation, community development, biodiversity, food provision and place shaping.

4.4 Green roofs

Green roofs, roofs which are covered with vegetation and soil, can reduce run-off and subsequently relieve the pressure on drainage systems, particularly at times of high intensity rainfall. Additionally, the benefits afforded to biodiversity can be significant by providing wildlife habitats, particularly in urban areas. They also enhance the thermal performance of buildings and have an important role to play in reducing the urban heat island effect. Green roofs also have the potential to contribute to wider landscape character in a particular location.

4.5 Sustainable urban drainage systems (SUDs)

Sustainable urban drainage systems (SUDs) reduce the negative impacts of development on surface water drainage. SUDs can minimise the risk of flooding and pollution via attenuation and storage with additional benefits including improvements to local environmental quality, the creation of habitats for biodiversity and general improvement to the quality of life for local communities.

4.6 Managed coastal realignment

Sea level rise poses significant challenges to the management of flood risk. Coastal managed realignment schemes can alleviate some of this risk whilst providing habitat creation as well as a range of other multiple benefits for local environments and communities.

4.7 Plant species selection

Landscape architects understand what species to plant, where to plant them and the conditions different species require in order to thrive. This knowledge is invaluable in the face of changing climatic conditions, particularly arising from the impacts on the quality and availability of water and the potential increase in pests and disease.

4.8 Water

Incorporating grey water (domestic waste water) recycling systems into the design process can assist in adapting to hotter drier summers when pressure on conventional supplies is likely to be greatest. Grey water can be used in place of these conventional supplies in, for example, irrigation and toilet systems.

4.9 The early involvement of landscape architects in a coordinating capacity is essential to ensure that these approaches are effectively implemented and adequately respond to the challenge of climate change.

5. Recommendations

The Landscape Institute makes the following recommendations. If realised, the holistic approach taken by landscape architects to place-making and its role in combating climate change will be more widely recognised. The Landscape Institute will continue to work with members, stakeholders and decision makers in order to realise these recommendations.

- 1 Climate change adaptation and mitigation action plans will be incorporated into planning policy at national, regional and local levels.
- 2 Minimum regulatory standards for surface water run-off in new residential development and non-domestic buildings will be set.
- 3 Objective landscape and urban design criteria will be incorporated into the Code for Sustainable Homes, BREEAM and any future code for sustainable non-domestic buildings that may be introduced by government.
- 4 Landscape architects will be appointed in a leadership role on all regeneration projects, both commercial and public, at the earliest stages of development to ensure that an holistic approach is taken.
- 5 Interdisciplinary team-working between design, planning and construction professions will become the basis for the creation of sustainable places which are resilient to climate change and will deliver a range of public benefits.
- 6 Management and maintenance of green space will be adequately funded, reflecting its full value to society, and should be based on those regimes forming part of the original design plans.
- 7 Sustainable urban drainage systems (SUDs) will be an essential prerequisite for water management in new development.
- 8 Full consideration will be given to the use of green roofs and green walls on all new and, where feasible, existing development.
- 9 New housing development will, where feasible, incorporate methods of sustainable food production.
- 10 New urban spaces at all scales, both private and public and including streets, will incorporate substantial vegetation cover where this is possible.
- 11 Hard and soft spaces at all scales of new urban development will be designed and managed to be multifunctional.
- 12 Landscape architects will receive adequate additional training to enable them to continuously meet the demands of a changing climate.

6.1 Government departments, agencies and non-departmental public bodies

Department for Business, Enterprise and Regulatory Reform www.berr.gov.uk
Department for Communities and Local Government www.communities.gov.uk
Department for Environment, Food and Rural Affairs www.defra.gov.uk
CABE (Commission for Architecture and the Built Environment) www.cabe.org.uk
Environment Agency www.environment-agency.gov.uk
Natural England www.naturalengland.org.uk
Sustainable Development Commission www.sd-commission.org.uk

6.2 National Bodies and Regional Development Agencies

Scotland www.scotland.gov.uk
Northern Ireland www.doeni.gov.uk
Wales www.wales.gov.uk
North West www.nwda.co.uk
North East www.onenortheast.co.uk
Yorkshire www.yorkshire-forward.com
West Midlands www.advantagewm.co.uk
East Midlands www.emda.org.uk
East of England www.eeda.org.uk
South West www.southwestrda.org.uk
South East www.seeda.co.uk
London www.london.gov.uk

6.3 Key stakeholders

Academy for Sustainable Communities www.ascskills.org.uk
CIC www.cic.org.uk
CIWEM www.ciwem.org.uk
Greenspace www.green-space.org.uk
Horticultural Trades Association www.the-hta.org.uk
ICE www.ice.org.uk
IEMA www.iema.net
IEEM www.ieem.org.uk
Local Government Association www.lga.gov.uk
RTPI (Royal Town Planning Institute) www.rtpi.org.uk
RIBA (Royal Institute of British Architects) www.architecture.com
Society for the Environment www.socenv.org.uk
TCPA (Town and Country Planning Association) www.tcpa.org.uk
Tree Council www.treecouncil.org.uk
WRAP www.wrap.org.uk

6.4 Research and resources

Adaptation strategies for climate change in the urban environment
www.k4cc.org/bkcc/asccue
Inter-Governmental Panel on Climate Change www.ipcc.ch
Planning Portal www.planningportal.gov.uk
Sustaining knowledge for a changing climate www.k4cc.org
Tyndall Centre for Climate Research www.tyndall.ac.uk
UKCIP (UK Climate Impacts Programme) www.ukcip.org.uk
UN Framework Convention on Climate Change www.unfccc.int

6.5 Publications

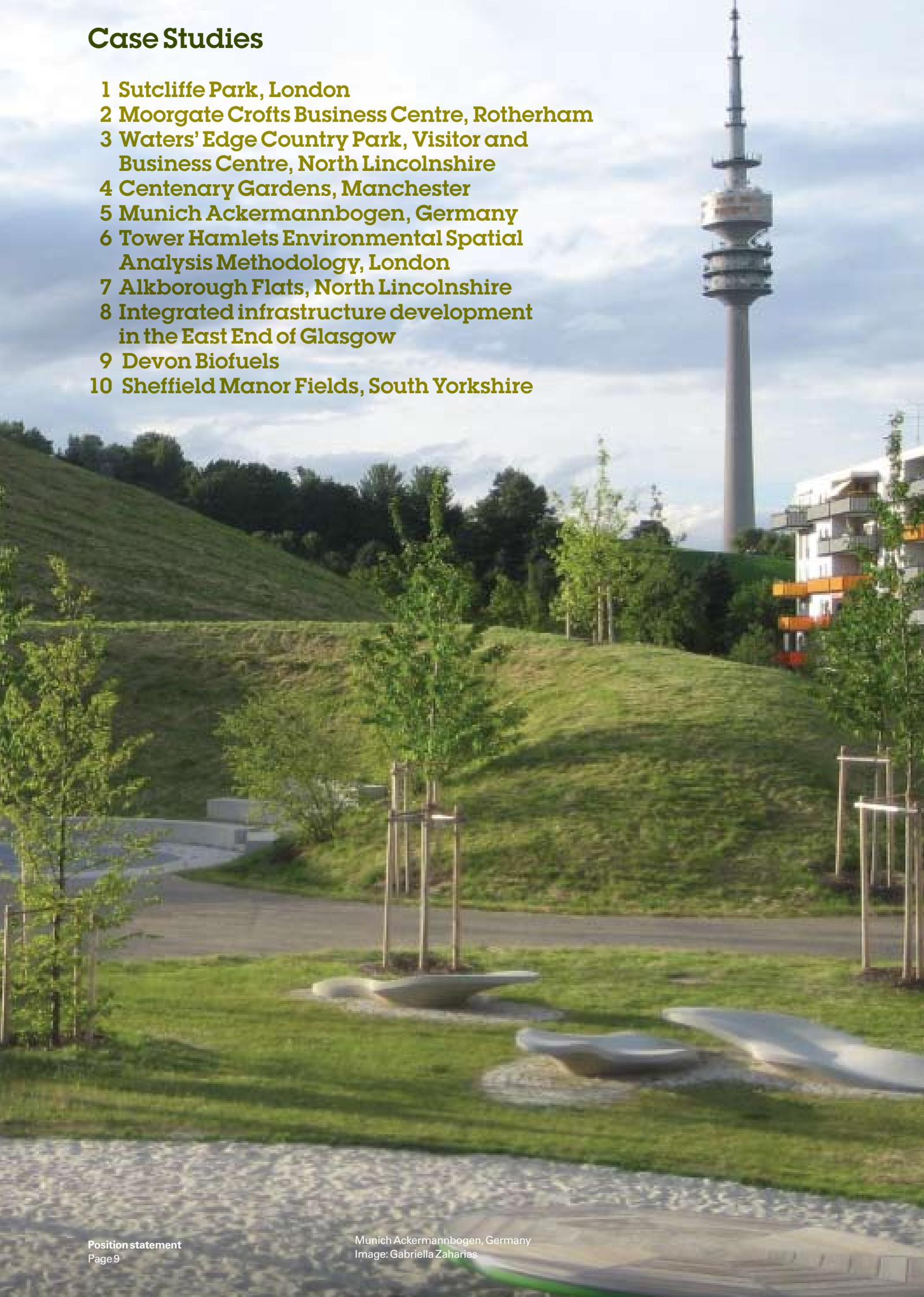
The Landscape Institute Library holds a specialist collection of books, journals, and publications relating to landscape architecture. Through the Library, we also offer an enquiry and research service available both to members and the public, including the following:

- compiling bibliographies
 - undertaking subject searches
 - sourcing references
 - reprographics
 - research enquiries*
 - sourcing policy documents, reports and legislation
- Contact: library@landscapeinstitute.org



Case Studies

- 1 Sutcliffe Park, London
- 2 Moorgate Crofts Business Centre, Rotherham
- 3 Waters' Edge Country Park, Visitor and Business Centre, North Lincolnshire
- 4 Centenary Gardens, Manchester
- 5 Munich Ackermannbogen, Germany
- 6 Tower Hamlets Environmental Spatial Analysis Methodology, London
- 7 Alkborough Flats, North Lincolnshire
- 8 Integrated infrastructure development in the East End of Glasgow
- 9 Devon Biofuels
- 10 Sheffield Manor Fields, South Yorkshire



Sutcliffe Park

Description

The Quaggy River Flood Risk Management scheme adapted a number of public and private multifunctional green spaces linked by the Quaggy River in order to reduce flood risk and the potential impacts of climate change for 600 homes and businesses, and more than 4000 people living and working in the London boroughs of Greenwich and Lewisham. The scheme was designed and implemented by the Environment Agency over a period of 15 years up until 2007.

The core part of the project is Sutcliffe Park, a district park of 35 hectares serving the surrounding area of Greenwich on land which had been levelled in the middle of the 20th century to provide an extensive area of featureless playing fields containing the culverted and realigned river. Following redevelopment, Sutcliffe Park has been transformed into a high quality natural environment featuring:

- a meandering river
- a lake and ponds
- wildflower meadows and avenues of trees
- widely accessible boardwalks, paths, seating areas and viewing points
- new and enhanced wildlife habitats, including Biodiversity Action Plan habitat

The project also incorporated adaptation and regeneration of green spaces at Manor Park and Weigall Road to accommodate flood storage, and innovative environmental and flood risk management measures along the Quaggy River itself including the restoration of natural features within the channel near Manor Park and set back defences which were incorporated in private gardens facing the river.



Project Summary

Client

Environment Agency
London Borough of Greenwich, London Borough of Lewisham

Lead landscape architect

Environment Agency National Environmental Assessment Service Landscape Architects

Project manager

Environment Agency National Capital Programme Management Service

Structural/civil engineer

Halcrow

Cost consultant

EC Harris

CDM coordinator

Halcrow

Contractors

McAlpine – civil engineering contractors

English Landscapes – landscape works

Breheeny – other civil engineering

Deacon Landscapes

Further information

Richard Copas, Environment Agency
richard.copas@environment-agency.gov.uk

Images

Environment Agency



Moorgate Crofts Business Centre

2

Description

Moorgate Crofts Business Centre, which opened in 2005, was the first new building in the 25 year Rotherham Renaissance programme. The inclusion of the borough's first major green roof reflects the requirements of the client, Rotherham Investment and Development Office (RiDO), to consider sustainability as an integral part of the design, and to provide a demonstration site. The building design uses a mix of traditional and modern materials, with an emphasis on environmentally economic technologies such as geothermal heating and cooling together with the use of recycled building materials.

The green roof was designed by Rotherham Metropolitan Borough Council's Landscape Design Team to deliver high-impact greening. The Team were particularly interested in semi-extensive green roofs, which afford greater visual and biodiversity benefits than the more commonly used sedum roofs. However, these semi-extensive roofs still use a restricted substrate depth and reduce costs and maintenance compared to conventional intensive roof gardens. Specifically, the lower roof comprises 200mm semi-extensive substrate planted with drought-tolerant perennials, ornamental grasses, bulbs and alpines. The upper roof consists of 50mm extensive substrate and a sedum mat, as this is not accessible or overlooked. Dr Nigel Dunnett of Sheffield University's Department of Landscape helped with the development of the planting mixes and species selection, based on his research into green roofs.

The scheme is significant for green roof promotion and development within the UK due to its pioneering use of semi-extensive roof planting. Its performance is being studied by Sheffield University to add to the growing body of knowledge on the subject of green roofs. The green roof has raised the profile of the Centre and proved to be a valuable marketing tool. It has also added immensely to the Centre's attraction as an incubator for start-up businesses.

Project Summary

Client

Rotherham Investment and Development Office (RiDO)

Lead landscape architect

Rotherham Metropolitan Borough Council (RMBC)
Streetpride Landscape Design Team

Project manager

RiDO

Architect

Rotherham Construction Partnership (RCP)
Architects

Structural engineer

RMBC Streetpride Structures

Mechanical/electrical engineer

RCP Building Services Engineers

Drainage engineer

RMBC Streetpride Drainage

Horticultural advice

Dr Nigel Dunnett, Department of Landscape,
Sheffield University

Quantity surveyors

RCP Projects and Partnerships

Cost consultant

RCP Projects and Partnerships

CDM coordinator

RCP Architects

Contractors

Hall Construction, Hull

M&J Roofing – green roof system installation,
sedum mat

English Landscapes – planting and maintenance of
semi-extensive green roof

Site area

770m²

Completion date

June 2005 (Centre opened October 2005)

Further information

Michéla Griffith,
RMBC Streetpride Landscape Design
michela.griffith@rotherham.gov.uk

Images

RMBC



Waters' Edge Country Park, Visitor and Business Centre

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Description

In March 1997, Maslen Environmental were appointed by North Lincolnshire Council to project manage the reclamation and restoration of an 86 hectare contaminated factory site at Barton-upon-Humber. The client was also committed to developing a flagship building within the site, the Visitor and Business Centre, which incorporated the highest standards of sustainable construction.

Maslen Environmental was involved in several aspects of the scheme, including:

- conducting design development and masterplanning
- producing the Environmental Statement
- managing the initial consultation activity
- undertaking the planning submission for the reclamation and restoration

Furthermore, the landscape architects were appointed as project managers for the Visitor and Business Centre, a building which incorporated the following climate change adaptation and mitigation measures:

- solar gain
- solar shading features
- passive ventilation
- grey water recycling
- biomass boiler
- the region's first large-scale car park incorporating sustainable urban drainage systems (SUDs)
- sustainability advisors on construction and restoration techniques

Project Summary

Client

North Lincolnshire Council

Lead landscape architect

Maslen Environmental

Project manager

Maslen Environmental

Architect

Bareham Architects

Mechanical/electrical engineer

Furness Green Partnership

Environmental consultant

FWS Consultants

Environmental engineers

Montgomery Watson

Nature conservation advisors

Lincolnshire Wildlife Trust

Surveyors

Faithful and Gould

Contractors

Ogdens Demolition Ltd

Fox Contracting Ltd

Cheetham Hill Construction

Mowlem Ltd

UCS Ltd

Darren Roberts Countryside Services

P&H Construction

Henry Boot

Longcross

Further information

Maslen Environmental

www.maslen-environmental.com

Images

Top: David Lee Photography

Bottom: North Lincolnshire Council



Centenary Gardens

Description

Groundwork were responsible for transforming a derelict site in Old Trafford, Manchester, into an accessible recreational space of approximately 900m² for the community and local school which incorporated environmentally sustainable materials built by local labour. Groundwork produced the sketch and detailed designs for the project as well as the sourcing of sustainable materials, tender package production and contract administration.

A detailed brief came out of initial consultation with the numerous clients and stakeholders, including the local school, residents, and the landowner Trafford Council Greenspace & Sustainability Team. This brief included:

- the transformation of a derelict, disused site into an innovative, accessible, local community space
- engaging the local community with the project to ensure the long term success of the garden
- incorporating environmentally sustainable and local materials in as many aspects of the garden design as possible
- utilising local labour and expertise wherever possible

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Landscape architects created a layout which demonstrated that modern design has an important role in community spaces. However, the key aspects of the scheme relate to sustainability and climate change mitigation. The boardwalk decking is reclaimed from a bridge in nearby Salford. The stepping stones were sourced from a cobbled alleyway only half a mile from the site. The mulch is coarse compost from a social enterprise that processes all fruit and vegetable waste from nearby New Smithfield Market in East Manchester. The gate and railings were designed by a local artist. Reclaimed dry stone walls and quarried wall copings and boulders were sourced from the Peak District. Where local or reclaimed materials could not be sourced, materials with recycled content were specified. The park also has space to grow food.

Project Summary

Client

Trafford Council Greenspace & Sustainability Team
Seymour Park Primary School
Safer Stronger Communities Fund for Old Trafford

Lead landscape architect

Groundwork Manchester

CDM coordinator

Groundwork Manchester

Contractors

County Landscape Development

Further information

Groundwork Manchester

www.manchester.groundworknw.org.uk

Images

Left: Shaw & Shaw Photography

Right: Karen Wright Photography



Munich Ackermannbogen

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Project Summary

Landscape

Client

City of Munich, Department of Public Construction
SWM Munich City Utilities

Lead landscape architect

Zaharias Landschaftsarchitekten, Munich

Project manager

Main Division Gardening: Nicole Preussner,
Harald Mattheas

Site manager Walter Zimmermann

Soil mechanic consultants Professor Dr Armin Horn

Soil consultant Johannes Prügl

Contractors

Gaissmaier Landschaftsbau GmbH & Co KG
Heller Landschaft Service GmbH & Co KG

Solar Energy Concept

Client

Stadtwerke München GmbH

Project manager

Cornelia Sierks – Stadtwerke München

Karlhans Stark – Prof. Weiß &
Bisani Ingenieurgesellschaft für
Baubetriebsmanagement mbH

Research team

ZAE Bayern

Solites Stuttgart

Structural/civil engineer

Ing. Büro Lichtenfels

Lead architect

Kulle & Hofsetter TGA Consulting

Site management

Aeteba Projektmanagement

Contractors

Mayerhofer Hoch, Tief- und Ingenieurbau GmbH

Mickan General- Bau- Gesellschaft

Bösel Stahlbau GmbH

Karl Lausser GmbH

Bauer Elektrounternehmen GmbH und Co KG

Kuhn Elektrotechnik GmbH

TISUN made in Tirol by Teufel und Schwarz Teufel
und Schwarz GmbH

Further information

Zaharias Landschaftsarchitekten

www.zaharias.net

Image

Gabriella Zaharias

Description

In 1992, Munich City Council decided to redevelop 39.5 hectares of a former army barracks through a town planning competition to provide homes for approximately 4,800 people and work places for approximately 500 people. The site links Schwabing, an area of Munich 2.5km north of the city centre, with the south end of the 1972 Olympic Village Park.

The 2.3 hectares of green space which has been incorporated into the redevelopment forms the main connection between the existing and the new landscapes. This project demonstrates the benefits of green infrastructure provision and the skills of the landscape architect in incorporating renewable energy sources into the design of the park on the site.

There are various aspects of the park which help mitigate or adapt to climate change. These include:

- Local district heating from renewable solar energy.
Two hills were built from the material that was removed during construction of the site. One of these, the West Hill, incorporates an innovative and experimental concept in sustainable energy; a 6000m³ hot water tank beneath its surface in which solar energy is stored. This provides 50% of heating energy for the 320 homes of building phase 2.
- Sustainable use of resources.
Modelling the open space design with approximately 20,000m³ of gravel from the construction of the adjacent buildings. Providing sustainable drainage structures which allow rainwater to seep directly into the ground water through layers containing microbotic organisms.
- Reducing the carbon footprint of individuals.
Providing necessary infrastructure within walking or cycling distance. Creating attractive cycling paths and pedestrian ways thus encouraging uptake of sustainable forms of transport.
- Creating urban carbon sinks and reducing the urban heat island effect.
Using green roofs to cover the water tank and energy control centre. Adding to the total biomass in the town by planting native trees and creating lawns.
- Supporting biodiversity.
Providing habitats for biodiversity migration.



Case studies

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Landscape Institute

Landscape architecture and the challenge of climate change

Tower Hamlets Environmental Spatial Analysis Methodology

Description

In recognition of the important role of planning in responding to climate change, the London Borough of Tower Hamlets undertook a study with Land Use Consultants and the National Energy Foundation in 2007 which involved the technical and spatial assessment of opportunities for sustainable energy and biodiversity. As a result of this, practical and spatially specific measures to enhance sustainable energy and biodiversity opportunities within the area were identified and are now being integrated into the Borough's Local Development Framework through policies, pre-application advice, development briefs, master plans and the Biodiversity Action Plan.

Four outcomes were achieved by the methodology:

- Identification of low carbon/renewable energy technologies with the borough. This included 15 potential new combined heat and power networks and visible renewable energy technologies along the route to the Olympic Park in Stratford.
- Identification of spatial opportunities for maximizing the potential biodiversity enhancement, including 14 Biodiversity Enhancement Zones, a Black Redstart priority area and possible improvements to the Blue Ribbon Network.
- Providing a robust evidence base and clear recommendations for the Local Development Framework.
- Identification of funding and delivery mechanisms to secure the implementation of identified opportunities.

This project has translated the theory of spatial planning into a replicable, simple, practical planning process. This process could be applied to any neighbourhood, local authority area or region in the UK, to identify spatially specific opportunities for sustainable energy and biodiversity based on local characteristics.



Project Summary

Client

London Borough of Tower Hamlets

Lead landscape architect

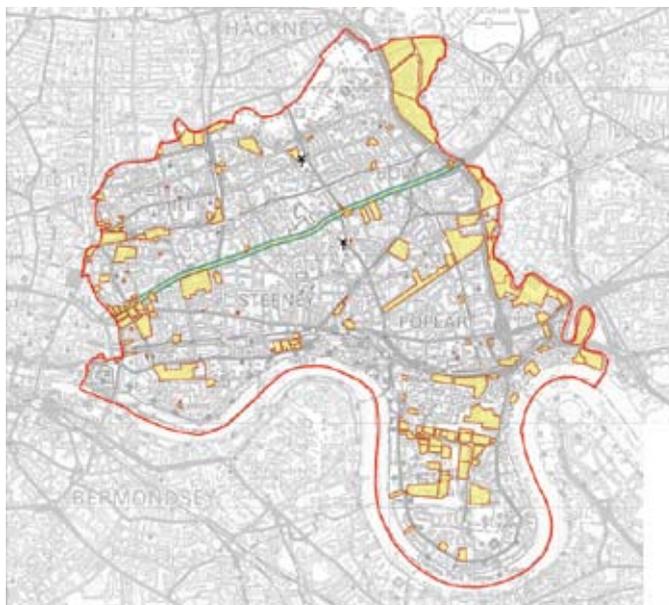
Land Use Consultants

Further information

Development and Renewal Directorate, London Borough of Tower Hamlets
www.towerhamlets.gov.uk

Images

Land Use Consultants



Alkborough Flats

Description

The £8 million Alkborough Flats managed realignment project is an innovative scheme addressing flood protection and habitat creation in compensation for habitat loss due to coastal squeeze.

As a result of climate change and post glacial geological processes, it is predicted that by 2050 relative sea level could rise by up to half a metre in the Humber area. This poses a massive challenge to managing flood risks, especially as 90,000 hectares of land in the Humber area is at or below the level of the highest tides.

The scheme, part of a wider Shoreline Management Plan for the Humber Estuary which seeks to address these challenges, has specifically involved breaching the existing defences and flooding 440 hectares of intensively farmed agricultural land on the south bank of the estuary. The project is an example of a more sustainable way to address flood risk and at the same time demonstrates the concept of multifunctionality; breaching existing defences has created new wildlife habitats, led to agricultural diversification and increased recreational opportunities in the area.

Landscape architects Maslen Environmental were employed to provide stakeholder engagement services and external funding support to the Environment Agency. The role also included the preparation of a number of external funding bids, the facilitation of stakeholder and partnership meetings and the development of local community projects such as the South Humber Wildlife and People Project and the Alkborough Community Archaeology Project. This project has illustrated how value can be added to flood management projects through successful stakeholder and community engagement.



Project Summary

Partners

Environment Agency (lead partner)

Natural England

North Lincolnshire Council

Associated British Ports

Project Manager

John Pygott, Environment Agency

Project Management Support and Stakeholder Engagement

Maslen Environmental

Engineering Design & EIA

Halcrow Group

Estuary Modelling

Consortia led by Black & Veatch

Main Contractor

Volker Stevin

Further information

Maslen Environmental

www.maslen-environmental.com

Images

Environment Agency



Integrated infrastructure development in the East End of Glasgow

Description

In July 2002 severe flooding occurred in the north and east of Glasgow. The full storm lasted for approximately 10 hours, measured 75mm depth and had a maximum intensity of 94.5mm/hr. The impact on residents, properties and businesses was severe. The City decided to improve the existing Victorian infrastructure by developing a Strategic Drainage Plan, and to place water management as an important feature in its development plan policy framework.

The East End is home to some 48,500 residents and, over the next six years, is going to alter radically. In an area of some 626 hectares 136 are derelict and the strategic development focus is on bringing major change through new roads, a 5,000 seat sports arena, a 1,500 seat velodrome, the village for Commonwealth Games Athletes in 2014, and major employer relocations. A new city quarter is to be created, for a population of the order of 57,250.

Work on the spatial strategy for the East End (EELDS) began in 2004 and from the start a new approach was taken to place making, basing the new local development policy frameworks on outcomes from Health Impact Assessment (HIA). The HIA demanded a network of quality urban landscapes of attractive green spaces, within walking distance of homes and workplaces. Combined with the need to address the water management issues, this created a strong foundation for sustainable development by utilising the professional interests of planners, landscape architects, architects and engineers. Glasgow recognised the opportunity to tackle landscape scale solutions and create integrated infrastructure combining water management networks with a walking/cycling network and a greenspace network. The EELDS was adopted in January 2008 and forms the basis for the more detailed work on large-scale masterplans. South Dalmarnock SUDS is a key pilot area for testing the strategic concepts as they translate into detailed design.



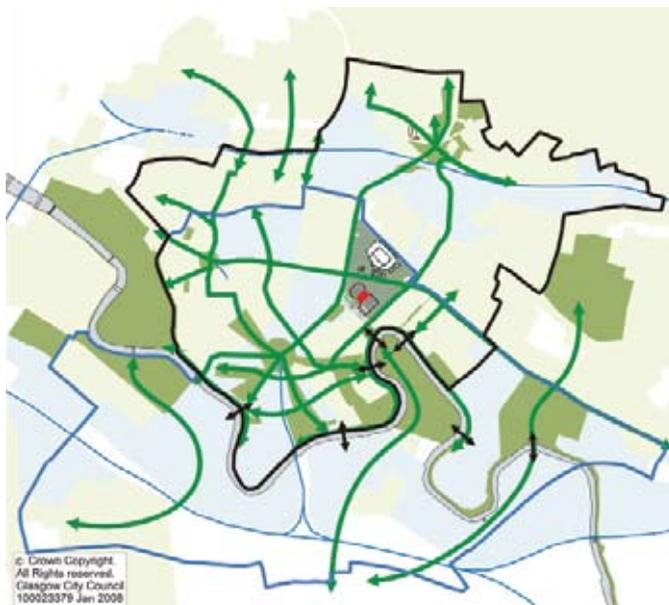
Project Summary

Further information

www.glasgow.gov.uk

Images

Glasgow City Council



Description

This case study considers the landscape architect's role in accommodating bioenergy (biofuel) crops into the landscape. Planting of energy crops, although outside planning control, can have a major impact on our landscape, particularly if grown on a large scale. However, landscape architects can influence the siting of such crops to minimise adverse impact on the landscape. In Devon, the Centre for Sustainable Energy (on behalf of a funding consortium led by Devon Wildlife Trust and the former Countryside Agency and English Nature, now Natural England) undertook a study to identify potential opportunities for biofuels – a 'biofuels opportunity statement'.

Landscape architects identified the sensitivity of the different landscape types to biofuel crops, in particular focusing on short rotation coppice and miscanthus. The landscape sensitivity assessment results showed that, if we are to preserve the existing character of the Devon landscape, there are relatively limited opportunities for growth of bioenergy crops on a large scale without changing existing landscape character. One of the most useful outputs of the assessment was the provision of guidance for each landscape type suggesting how energy crops could best be integrated into the landscape. This included advice such as focusing crops in areas already affected by cropping systems rather than conversion of pastoral areas to cropping; ensuring crop growth is dispersed rather than occupying large areas of adjacent fields; and setting planting away from the sensitive coastal edge. This information fed into the overall biofuels opportunities statement for Devon.



Project Summary

Client

Managed by the Devon Wildlife Trust on behalf of a funding consortium led by the former Countryside Agency and English Nature

Lead landscape architect

Land Use Consultants

Project manager

Centre for Sustainable Energy

Further information

www.devon.gov.uk/biomass

Image

The National Non-Food Crops Centre



Sheffield Manor Fields

Description

Manor Fields Park in Sheffield is a project taking formerly derelict land which had suffered considerable abuse and turning it into a place of enjoyment. Developed incrementally, the project has shown sensitivity to the site's natural characteristics with an eye to climate change, ensuring that capital investment is not wasted and the management requirements are neither too costly or onerous for the environment.

Natural vegetation has been retained and together with new management practices, encourages wild habitats which allow visitors to enhance their experiences alongside normal park activities. Recycled materials have been used wherever possible, reducing the impact of construction on natural resources. Material generated through onsite demolition works has removed the need to use road transport.

A SUDs system has removed the need for engineered below-ground structures and allows natural processes to occur as well as contributing to good design. The site functioned as intended during the floods of summer 2007, reducing the impact that the site and adjacent development might have had on the River Don. The design of the 100-year flood basin contained the flood; but within 4-5 days was being used once again as a community open space.

The development of Manor Fields has, through cooperation between the City Council and stakeholders, added significantly to the regeneration of the area, creating an inspiring, safe and welcoming quality space for residents and visitors alike. The approach of the Landscape Design Team has resulted in an environment which is well adapted to forecast climate scenarios as well as reducing the impact on future climate change.

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Project Summary

Client

Parks and Countryside – Sheffield City Council

Lead landscape architects

Environmental Planning and Landscape Design Team – Sheffield City Council

Project manager

Parks and Countryside – Sheffield City Council

Structural/civil engineer

Environmental Planning and Landscape Design Team – Sheffield City Council

Cost consultant

Design and Project Management – Sheffield City Council

CDM coordinator

Environmental Planning and Landscape Design Team – Sheffield City Council

Contractors

GF Tomlinson

Bernhard Landscape Ltd

Sheffield Wildlife Trust

Green Estate Ltd

Campbell Design and Engineering Ltd

Legacy Habitat Management

Andrew Skelton

Rockworks Ltd

Further information

www.sheffield.gov.uk

Images

Left: Roger Nowell

Right: Ian Stanyon







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The Landscape Institute is committed to reducing its carbon footprint and is currently reporting on progress against targets.

Under its Royal Charter, the Landscape Institute has a responsibility to protect, conserve and enhance the built and natural environment for the benefit of people, communities and biodiversity by promoting the arts and sciences of landscape architecture. Landscape architecture encompasses all aspects of the planning, design, implementation and management of landscapes and the environment in both urban and rural areas. Landscape architecture involves the assessment, conservation, development and creation of places that are environmentally robust, socially inclusive, aesthetically pleasing and functional as well as being ecologically healthy, both now and for future generations and particularly in the face of a changing climate.

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